

DETAILED DESCRIPTION 05-022614

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the pictorial communication equipment with which the modem used with a facsimile machine etc. and its peripheral circuit were provided with Integrated Circuit Sub-Division by which accumulation formation was carried out.

[0002]

[Description of the Prior Art] The modulation and demodulation circuit 21 to which this conventional kind of device performs the abnormal conditions from serial data to a line signal, and the recovery to serial data from a line signal as shown in drawing 2. The P/S (parallel/serial) conversion circuit 22 which changes into parallel data the serial data transmitted and received via the above-mentioned modulation and demodulation circuit 21, The HDLC control circuit 23 which performs signal processing by a HDLC frame to the parallel data outputted and inputted by this P/S conversion circuit, Accumulation formation of the parallel-data I/F (Interface Division) 24 which connects this HDLC control circuit 23 to the external bus line 8 is carried out as the semiconductor integrated circuit device 2, NCU (line control unit) 1, CPU (prime controller) 4, RAM5, ROM6, the image recorder 71, and the image reader 72 this semiconductor integrated circuit device 2 with external instrument I/F7 connected. Connecting with the common bus line 8 and constituting the main part of a facsimile machine was performed (see JP, S59-221167, A). [0003] It enables it for the secrecy device 91 to have performed the encryption and the decipherment of the facsimile signal which are transmitted and received from the circuit L in the facsimile machine shown in drawing 2. In order to connect this secrecy device 91, in addition to the composition mentioned above, serial input/output I/F92, the P/S conversion circuit 93, and the HDLC control circuit 94 are formed separately.

[0004]

[Problem(s) to be Solved by the Invention] However, according to this composition, in order to connect a secrecy device, the number of circuits increased, and there were a device's being complicated and a problem of high-cost-izing.

[0005] An above-mentioned problem is produced for the following Reasons. That is, the secrecy device 91 cannot be alone used, in order to make it the deciphered serial data serve as a predetermined HDLC frame, but on the occasion of the use, the P/S conversion circuit 93 and the HDLC control circuit 94 are needed separately. For this reason, the facsimile machine which can connect the secrecy device 91 surely could not but be complicated, and could not but become a high cost.

[0006] This invention was made in view of SUBJECT mentioned above, and an object of this invention is to provide the pictorial communication equipment which enables connection of a secrecy device for a device, without complicated and high-cost-izing.

[0007]

[Means for Solving the Problem] A modulation and demodulation circuit which performs abnormal conditions and a recovery between serial data and a line signal in order that this invention may solve above-mentioned SUBJECT, A P/S conversion circuit which changes into parallel data serial data transmitted and received via the above-mentioned modulation and demodulation circuit, A HDLC control circuit which performs signal

processing by a HDLC frame to parallel data outputted and inputted by this P/S conversion circuit. While carrying out accumulation formation by using as a semiconductor integrated circuit device parallel-data I/F which connects this HDLC control circuit to an external bus line. It has composition of making each draw each serial input/output of the above-mentioned modulation and demodulation circuit and the above-mentioned P/S conversion circuit to an external terminal of the above-mentioned semiconductor integrated circuit device in the state where it separated mutually.

[0008]

[Function] Since this invention can use the P/S conversion circuit and HDLC control circuit in a semiconductor integrated circuit device for connection of a secrecy device, above-mentioned composition enables a device intricately to connect a secrecy device to a facsimile machine etc., without high-cost-izing.

[0009]

[Example] Hereafter, working example of this invention is described, referring to a figure.

[0010] In a figure, identical codes shall show a same or considerable portion. Drawing 1 is what shows the outline composition of the semiconductor integrated circuit device by one working example of this invention, and the facsimile machine using this semiconductor integrated circuit device. A semiconductor integrated circuit device with which accumulation formation of the main circuits for NCU (line control unit) and 2 by which 1 is connected to the circuit L to perform transmission control of a facsimile signal was carried out, CPU using the general-purpose controller ***** micro computer with which the compression extension circuit of data and 4 were microcircuit-ized 3 (prime controller), RAM 5 remembers variable data, such as drawing information, to be, ROM six remembered fixed data, such as a system program, to be, In order that external instrument I/F to which the image recorder 71 and the image reader (scanner) 72 connect 7, and 8 may connect each part of each other mentioned above, a secrecy device and 92 are serial input/output I/F of the secrecy device 91 a bus line and 91.

[0011] The modulation and demodulation circuit 21 to which the above-mentioned semiconductor integrated circuit device 2 performs the abnormal conditions from serial data to a line signal, and the recovery to serial data from a line signal here, The P/S conversion circuit 22 which changes into parallel data the serial data transmitted and received via this modulation and demodulation circuit 21, The HDLC control circuit 23 which performs signal processing by a HDLC frame to the parallel data outputted and inputted by this P/S conversion circuit 22, Accumulation formation of the parallel data and I/F (Interface Division) 24 which connects this HDLC control circuit 23 to the external bus line 8 is carried out at the same semiconductor substrate. With this, each serial input/output of the above-mentioned modulation and demodulation circuit 21 and the above-mentioned P/S conversion circuit 22 is drawn by each in the state where it was separated mutually the external terminal P1 of the above-mentioned semiconductor integrated circuit device 2, and P2.

[0012] The above-mentioned external terminal P1 and P2 are connected to the secrecy device 91 via serial input/output I/F 92. The secrecy device 91 performs secrecy processing to the serial data exchanged between the modulation and demodulation circuit 21 in the above-mentioned semiconductor integrated circuit device 2, and the P/S conversion circuit 22. It is directly linked mutually via the secrecy device 91 between the above-mentioned external terminal P1 when not operating the secrecy device 91, and P2

(through state).

[0013]About the semiconductor integrated circuit device and facsimile machine which were constituted as mentioned above, the operation is explained below.

[0014]First, the case where the secrecy device 91 is in a non-operating state is explained. In this case, the modulation and demodulation circuit 21 and the P/S conversion circuit 22 in the semiconductor integrated circuit device 2 exchange serial data directly.

[0015]That is, after it is sent to the data compression extension circuit 3 via the bus line 8 after reception of the receiving drawing information from the circuit L was carried out by the circuits 21, 22, 23, and 24 in the semiconductor integrated circuit device 2 at the time of reception, and being restored to the original drawing information there, print recording is carried out to a recording form with the image recorder 71.

[0016]After compression processing of the reading drawing information from the image reader 72 is carried out in the data compression extension circuit 3 at the time of transmission, transmitting processing is carried out by the circuits 24, 23, 22, and 21 in the semiconductor integrated circuit device 2, and it is sent out in the circuit L.

[0017]Next, the case where the secrecy device 91 is in an operating state is explained. In this case, the modulation and demodulation circuit 21 and the P/S conversion circuit 22 in the semiconductor integrated circuit device 2 exchange data indirectly via the external terminal P1 and the secrecy device 91 connected via P2.

[0018]That is, after the serial data recovered from the input signal are inputted into the secrecy device 91 via the external terminal P1 by the modulation and demodulation circuit 21 in the semiconductor integrated circuit device 2 and decryption processing is carried out there at the time of reception, it is returned in the semiconductor integrated circuit device 2 from the external terminal P2. The decipherment data returned in the semiconductor integrated circuit device 2, After being changed into parallel data by the P/S conversion circuit 22 and carrying out a frame process in the HDLC control circuit 23, it is sent to the data compression extension circuit 3 via the external bus line 8 from parallel-data I/F24, and an expansion process is carried out there for record.

[0019]After the HDLC frame signal changed into serial data is inputted into the secrecy device 91 via the external terminal P2 by the P/S conversion circuit 22 in the semiconductor integrated circuit device 2 and encryption processing is carried out there at the time of transmission, it is returned in the semiconductor integrated circuit device 2 via the external terminal P1. The signal returned in the semiconductor integrated circuit device 2 is sent out in the circuit L, after a line signal becomes irregular by the modulation and demodulation circuit 21.

[0020]The P/S conversion circuit 22 and the HDLC control circuit 23 in the semiconductor integrated circuit device 2 are used for both the transmitting and receiving processing of a facsimile signal, and connection processing of the secrecy device 2 as mentioned above. thereby -- a device -- it can be used, being able to connect a secrecy device to a facsimile machine etc., without complicated and high-cost-izing.

[0021]

[Effect of the Invention]The modulation and demodulation circuit to which this invention performs the abnormal conditions and recovery between serial data and a line signal so that clearly from the above explanation, The P/S conversion circuit which changes into parallel data the serial data transmitted and received via the above-mentioned modulation and demodulation circuit, The HDLC control circuit which performs signal processing by

a HDLC frame to the parallel data outputted and inputted by this P/S conversion circuit, While carrying out accumulation formation by using as a semiconductor integrated circuit device parallel-data I/F which connects this HDLC control circuit to an external bus line, By making each draw each serial input/output of the above-mentioned modulation and demodulation circuit and the above-mentioned P/S conversion circuit to the external terminal of the above-mentioned semiconductor integrated circuit device in the state where it separated mutually, Since the P/S conversion circuit and HDLC control circuit in a semiconductor integrated circuit device can be used also for connection of a secrecy device, they are complicated and a thing which has the effect of becoming possible to connect with a facsimile machine etc. and use a secrecy device about a device, without high-cost-izing.

[Translation done.]